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ABSTRACT

A test preparation program was implemented at Southern Connecticut State University to assist students in passing the Praxis II content examination in physical education. The study program had not been evaluated for effectiveness. A review of the literature provided background information on teacher certification, test-taking skills, test preparation programs, and evaluation methodology. Data were collected on the certification examination scores of 80 teacher preparation program students. Inferential statistical analysis was completed with a chi-square analysis. The 0.5 level of significance and a critical value of 3.84 were used for the chi-square analysis. The value of chi square was 13.058. The alternative hypothesis was supported, and the null hypothesis rejected. Results reveal a statistically significant relationship between participation in the test preparation study program and success in passing the certification examination. It is concluded that, based on the statistical analysis, the study program is effective in improving the pass rate on the certification examination. Potential benefits to the university were identified. Three appendixes contain descriptions of the physical education test and its content and the test preparation study outline. (Contains 30 references.) (SLD)

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# STATISTICAL EVALUATION OF THE EFFECTIVENESS OF A PREPARATORY STUDY PROGRAM FOR THE TEACHER CERTIFICATION EXAMINATION IN PHYSICAL EDUCATION AT SOUTHERN CONNECTICUT STATE UNIVERSITY

Theory and Methods of Adult Education

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in partial fulfillment of the requirements for the

Degree of Doctor of Education

Nova Southeastern University

Revised January 2000

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Abstract of a practicum report presented to Nova Southeastern University in partial fulfillment of the requirements for the Degree of Doctor of Education

# STATISTICAL EVALUATION OF THE EFFECTIVENESS OF A PREPARATORY STUDY PROGRAM FOR THE TEACHER CERTIFICATION EXAMINATION IN PHYSICAL EDUCATION AT SOUTHERN CONNECTICUT STATE UNIVERSITY

by

Jean Mee

Revised January 2000

The problem addressed in this study was that a test preparation study program was being implemented to assist students in passing the physical education teacher certification examinations, and the study program had not been evaluated for effectiveness in meeting the purpose for which it had been designed. The purpose of the study was to conduct a statistical evaluation of the effectiveness of a preparatory study program for the teacher certification examination in physical education at Southern Connecticut State University.

A review of the literature was conducted which provided background on teacher certification tests, test-taking skills, test preparation programs, and evaluation methodology for educational programs. Research methodology and the post facto research design were used to answer the research question. Data was collected on the certification examination test scores of 80 teacher preparation program students during the period of time in which the study program has been available. Inferential statistical analysis was completed on the data collected for which a chi-

square analysis was applied. The .05 level of significance and a critical value of 3.84 were used for the chi-square analysis. The value of chi-square was 13.058. The alternative hypothesis was supported, and the null hypothesis was rejected.

Results of the study reveal a statistically significant relationship between participation in the test preparation study program and success in passing the certification examination. It was concluded that, based on the statistical analysis, the study program is effective in improving the pass-rate on the certification examination. Potential benefits to the university were identified as improving services to students and increasing the university's success in providing job-ready teachers at a time when teacher shortages exist.

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# Chapter 1

# INTRODUCTION

## Background

Southern Connecticut State University is a public institution which has traditionally prepared its students for careers in teaching. Originating in 1893, the school was known as New Haven Normal School, became New Haven Teachers' College, then Southern Connecticut State College, and within the last eight years has consolidated with three other state colleges to form the Connecticut State University System. SCSU has expanded its programs of study to include business, finance, arts and theater, women's studies and a wide range of graduate and undergraduate courses and programs. Its primary mission, however, is to prepare men and women for futures in the field of education.

One of the State of Connecticut's requirements for completion of a teacher certification program, for all subject areas, is the taking and passing of the Praxis II subject area assessment of content knowledge. The examinations are developed, administered and scored by an independent testing service, and scores are reported directly to the State Department of Education, the university's Records Office, and to the student. Technically, students have completed the teacher preparation program when they have met all of the academic requirements of a four-year academic program and have graduated with a Bachelor of Science degree. However, the Connecticut State Department of Education further requires the successful completion of a content-specific examination, the Praxis II, taken independently at the conclusion of the degree program, in order for graduates to receive the Initial Educator Certificate needed for entry into public school teaching.

## Nature of the Problem

The physical education teacher preparation program currently does not involve itself formally in preparing students to take the Praxis II Examination. In the four years that the Praxis Examination Series has been a certification requirement, a seemingly high proportion of seniors and graduates have not passed the Praxis II on the first attempt. The independent testing agency, the Educational Testing Service (ETS), regularly publishes statistical data on the pass-rates for its various examinations. Recently, ETS reported a forty percent fail-rate nation-wide on the teacher certification examinations it administers (ETS, 1998). In fact, many students require several attempts before passing. The fail rate of physical education teacher certification students at SCSU is thirty-six percent, only slightly better than the national rate.

Currently, in Connecticut, there is a shortage of physical education teachers who are qualified to step into the many vacancies created by increasing student enrollments and teacher retirements. The shortage of minority teachers in the state is also of key concern, given the increasing numbers of minority students in Connecticut schools in general. Concurrently, the number of minority teacher candidates in the state's teacher preparation programs is much too low to fill the need for minority teachers. The need for teachers, especially minorities, has a direct bearing on the necessity to provide support for all teacher preparation students in successfully completing the Praxis II Examinations, thereby assisting them in becoming job-ready.

In response to students asking for help in preparing for the examination, a faculty member has developed a study program. The faculty member has followed the study program and has taken the examination under authentic conditions in order to test the effectiveness of the study prescription. Based on the faculty member's own experiences as well as feedback from study

group participants, the test preparation program has been revised. Currently, the faculty member volunteers to meet with students on a regular basis to provide guidance in the use of the study program. The content validity of the study program is the subject of a separate study. The problem is that a study program has been developed and is being implemented while the effectiveness of the program has not yet been evaluated.

## Purpose of the Study

The primary reason for developing the study program is to assist students in passing the certification examination. While students have generally expressed that the program has been helpful, it has not been formally evaluated. The purpose of this study was to evaluate, statistically, the extent to which the program is successful in achieving its main objective.

## Significance to the Institution

The actions that may be taken by the university and the School of Education as a result of this study include the following possibilities. If the study program is determined to be effective in improving the pass-rate on the Physical Education teacher certification examination, other teacher preparation programs in the School of Education may use it as a model for the development of study programs for their content areas. Within the Physical Education teacher preparation program, the study program may become a regular course offering for all teacher certification candidates.

## Relationship to Seminar

This study is related to the Theory and Methods of Adult Education seminar in that the program of study for test preparation is a course of study specifically developed to prepare students to take and pass the teacher certification examination. Principles of adult education

were used in the development of the study program. The evaluation of the effectiveness of programs is an essential element of any educational enterprise.

## Research Question

The research question that this study addressed was, "Is the study program effective in improving the pass-rate on the certification examination?"

## Research Hypothesis

The research hypothesis for this study was that those students who participate in the study program will pass the certification examination at a significantly higher rate than those who do not participate.

## Definition of Terms

For the purposes of this study, the following terms need clarification.

Praxis II Examination. The Praxis II Examination consists of subject assessments intended to measure knowledge of subjects the teacher preparation graduate will be certified to teach. The assessment is also intended to measure general subject-specific pedagogical skills and knowledge. The State of Connecticut Department of Education Teaching Certification Bureau requires that two components of the Praxis II Examination be passed, the 0091 and 0092 sessions, each with a minimum passing score of 154 (See Appendices A and B).

Test Preparation Study Program. The Praxis II Test Preparation Study Program is a seminar and workshop format, which meets five times with groups of students who are planning to take the Praxis II Examinations in Physical Education Content Knowledge (0091) and Physical Education: Movement Forms - Analysis and Design (0092) in the foreseeable future. Students attend voluntarily. Sessions are one hour in length, except for Session 3, which is a 2-hour

simulated test. There is no fee for participation in the study program, and no academic credit is awarded (See Appendix C).

Chapter 2

# REVIEW OF LITERATURE

## Overview

Connecticut's Education Enhancement Act of 1984 provides for a network of support and assessment programs that represent a comprehensive effort to attract and retain highly qualified teachers. In 1990, the Connecticut Competency Examination for Prospective Teachers (CONNCEPT) program was regarded as the foundation piece of the Enhancement Act. The centerpiece of this program was the CONNCEPT Examination. In a report documenting the transformation that had taken place in Connecticut as a result of the CONNCEPT program, critical needs and policy implications were identified. Data on the overall performance of CONNCEPT examinees over the four years of the program, performance on individual subtests over the period, performance by certain key indicators, e.g. reported SAT scores, ethnic status, gender, and institutional affiliation of examinees was included in an evaluative report. The report confirms the effectiveness of CONNCEPT in significantly increasing the level of skills of individuals seeking Connecticut certification without jeopardizing teacher supply. However, low minority representation indicated that much needed to be done in the areas of preparation, remediation, and recruitment (Connecticut State Department of Education, 1990). The Connecticut State Department of Education contracted for the Praxis Series Examinations, developed and administered by the Educational Testing Service (ETS) due to its more widespread use across the country and the ETS's documentation supporting the reduction of testing bias against minorities. The second stage of the Praxis Series Examinations, the Praxis II, consists of assessments of content knowledge in the specific subject area in which candidates will be certified to teach.

## Types of Test Formats

An issue bearing consideration is the nature of the particular certification examination. The two examination sessions which are required for physical education teacher candidates in Connecticut are a multiple-choice content knowledge examination (0091) (See Appendix A) and an essay examination on movement forms, analysis and program design (0092) (See Appendix B). The content knowledge assessment is a multiple-choice format, and the movement forms, analysis and design assessment is a constructed-response format. Since the examinations are nationally standardized, the examinee is being assessed on content that is not necessarily specific to their particular institution's preparation program, nor even the content that drives the common core of teaching in the particular state in which the teacher would be certified. However, graduates need to pass in order to obtain teacher certification.

In the first section of its policy notes, the ETS examines teacher availability, and concludes that there is an undeniable shortage of minority teachers. In its second section, the agency reviews the background and achievements of minority group members, chiefly Black and Hispanic teacher candidates, who take the NTE tests. A study of successful and unsuccessful candidates found that strong academic preparation and support programs are essential for the development of prospective minority teachers (ETS, 1991).

Standardized tests have become a permanent feature of the educational enterprise. Unlike other types of tests, standardized tests serve to determine where a particular student stands with respect to a sample of students intended to represent students in general. Scores are recorded in terms of percentiles or grade equivalents - that is, what percent of students in the sample scored lower than the student in question, or what level of achievement or knowledge a given student's score represents (Lyman, 1998). Statistics published by ETS indicate that a high proportion,

over forty percent, of graduates nation-wide do not pass the certification examinations in any given test administration period (Educational Testing Service, 1991).

Standardized tests are typically administered under highly controlled conditions so that students' scores can be fairly compared with students who took the test under those same conditions. Frequently, these conditions vary markedly from the conditions to which students are accustomed. The tasks themselves may be very different from classroom tasks familiar to students. Many students have little difficulty coping with these unusual conditions and novel tasks. However, some students do have difficulty demonstrating their skills and knowledge under these conditions. Such students can benefit greatly from training in test-taking skills (Scruggs & Mastropieri, 1992).

## The Need for Teaching Test-Taking Skills

The helpfulness of study programs in test preparation is an element which bears consideration. The conclusion of one study was that the best way students can improve their entrance examination scores is to enroll in more preparatory courses. In this study, strategies used by teachers included the teachers' acquiring previous tests actually given and using them in the preparatory courses (VanScoy, 1997). Aggressive test preparation, including adjustment of attitude on the part of the test taker are part of a system described by Judy Beal (Beal, 1997). In this system, the test preparation program includes not only the intensive review of content which is anticipated to be on the standardized test, but also incorporates changes in attitudes as important in the examinees' approach to the taking of the test.

Many teachers have found that their students are less intimidated by standardized tests when they have had the chance to discuss such basic topics as test objectives, skills, affective and

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cognitive learning, grading curves, scoring procedures, answer sheets, and especially the purposes behind particular tests (Devine, 1989).

Students may be having difficulty passing the examinations for several reasons. They may not know the content material; they may not understand the vocabulary used in directions and test questions; students may not be able to adequately express themselves on the constructed response test; they may have problems due to the way the tests are constructed. Some possible solutions might be to re-write instructions or rephrase questions and answer choices, read directions and questions as a group and discuss interpretations, and inquire whether students are having specific problems (Idol, 1996).

In a program to help Pennsylvania adult learners prepare for business school entrance examinations, students were given simulated tests developed specifically for orientation to test format, content, vocabulary, and time-limits that would be encountered during the test-taking event (Project Tune-Up, 1995). The use of these strategies in combination was shown to significantly improve the percentage of candidates eligible for acceptance.

Millman, Bishop and Ebel (1965) defined "test-wiseness" as "a subject's capacity to utilize the characteristics and formats of the test and/or the test-taking situation to receive a high score" (Millman, et al, p. 707). In other words, students high in "test-wiseness" can score higher than students of equal ability but lacking test-wiseness, by using their knowledge of specific test formats and testing situations to maximize their performance. Test-taking skills, then, are the skills that, when used effectively, contribute to a "test-wise" individual. Although test-wiseness is not completely independent of other cognitive abilities, such as general intelligence, it nonetheless has been demonstrated to have some of its own unique properties (Scruggs & Mastropieri, 1992). Millman and his colleagues developed a taxonomy of test-taking skills, in

which they identified six major elements: four of these were considered to be independent of the test maker or test purpose and can be applied to tests generally. Two were considered to be dependent on specific knowledge of the test maker or test purpose. The four independent elements included time-using strategies, error avoidance strategies, guessing strategies, and deductive reasoning strategies. The two elements identified as dependent on test constructor or test purpose were intent consideration strategies and cue-using strategies.

How test taking skills are taught depends on the specific skill or set of skills to be learned, as well as the age and ability of the learners. Scruggs and Mastropieri (1992) recommend that the teacher provide direct teaching of the skills in question followed by guided and independent practice on a variety of practice tests with review and feedback of student progress. They feel that teachers should always consider how students will be required to respond on tests, and be sure they will answer questions to the best of their ability. Students should practice studying and responding in the way in which their knowledge will later be evaluated. That is, if students will be required to write out essay responses, they should be given opportunities to study and practice writing essay-type responses. During these practice sessions, teachers can determine which, if any, performance deficits are due to inadequate content knowledge, and which are due to inadequate test-taking skills.

The aim of test-taking skills training is to improve the overall validity of the test by making scores more accurately reflect what students really know. This is done by making sure that students lose points only because they do not know the information, and not for some reason unrelated to content knowledge, such as marking an answer choice incorrectly, or misinterpreting the test directions. "Teaching to the test," on the other hand, refers directly to teaching specific

items which will appear on the test. If the entire content being taught is being tested, it makes sense to teach to the test (Scruggs & Mastropieri, 1992).

## Identifying Test-Taking Skills

Many students are poorly prepared for test-taking situations, and this lack of test-wiseness is often responsible for test scores which do not accurately reflect the students' knowledge (Scruggs & Mastropieri, 1992). In designing a prescription to teach test-taking skills, Scruggs and Mastropieri first pose two guiding questions. First, 'what are test-taking skills?' Second, 'how do you teach test-taking skills?'

A third question that needs to be answered in designing a program for teaching test-taking skills is that of determining which skills need to be taught. Test formats can be a particular source of difficulty for some students. Using specific test formats for practice can help determine whether students are likely to have difficulty manipulating these formats. Research by Veit and Scruggs (1986) has suggested that many students have difficulty with the use of separate answer sheets. Scruggs and Mastropieri (1992) recommend working with students on improving their ability to use separate answer sheets so that this problem does not obscure what they know. They suggest specific strategies including practicing speed, correctness, and correct coloring on separate answer sheets under simulated test taking conditions.

Veit and Scruggs (1986) found in their research that students could gain as much as ten to fifteen percentile points by improving test-taking skills without even reviewing the content being tested. Further, Scruggs & Mastropieri (1992) suggest that showing students how much better they are taking tests reduces the students' level of anxiety and therefore improves performance. General all-purpose test-taking strategies include (1)academic preparation strategies, (2)physical

preparation strategies, (3)attitude-improving strategies, (4) anxiety-reducing strategies, and (5) motivational strategies (Veit & Scruggs, 1986).

## The Need to Evaluate

Curriculum assessment, traditionally, is seen as something that occurs at the conclusion of some area or unit of curriculum study. The curriculum is perceived to be a kind of applied treatment that must be assessed in terms of its predetermined goals and prefashioned outcomes. While such an aspect of assessment in the curriculum is certainly important, the progressive idea of assessment in the curriculum is one that is continuous and that, in certain instances, might be an initiating activity rather than a concluding one in the conduct of curriculum improvement or reform (Hlebowitsh, 1995).

Assessment, it is important to note, is of the curriculum. It is part and parcel of the very essence of the curriculum. Questions related to what to teach, how to teach, and why to teach (all fundamental to the construction of the curriculum) are always accompanied by a desire to know about effects. To know, for instance, whether or not certain methods of knowledge organization or certain pedagogic strategies met certain expected outcomes, or to know whether or not the rationale behind the curriculum was justifiable in terms of its consequences in the lives of learners. The question is not whether assessment will play a role in the curriculum, but what its nature shall be.

Ideally, of course, the widest range of assessment and testing techniques - including quantitative measures, essays, interviews, portfolios, and various performance and achievement exams - should be used in the curriculum. This multi-faceted strategy toward assessment allows the curriculum to operate without being unduly influenced by the dominance of any particular

assessment methodology, and it protects against the condition of building the curriculum around the assessment approach (Hlebowitsh, 1995).

The process of evaluating the effectiveness of a program which is intended to be continued is, in effect, a plan for improvement. The program, prior to its evaluation, is essentially a pilot program. Until material has been tried out by the population for whom it was intended, the degree to which it meets its intended objectives is uncertain (Rowntree, 1994). The process of getting feedback about the acceptability and effectiveness of materials is incorporated into the concept of evaluation. Evaluation takes three main forms: critical commenting, piloting, and continuous monitoring. Rowntree (p. 160) provides a list of issues for inquiry during the evaluation process. The list, which applies directly to evaluation during the piloting process, includes four major components: (1)theoretical instruction, including clarification of course aims and objectives, relevance of content, suitability of methods and media, and personal guidance, (2)practical work, including coverage of skills, relation of theory to practice, availability of feedback, and relevance to "real-life" situations, (3)assessment, including appropriateness, clarity, helpfulness of feedback, and availability of individual help, and (4)general ongoing evaluation, including responsiveness to learners' needs, learner perceptions, rating by learners of course feature, and learner suggestions for improvement. Rowntree suggests that these issues be raised with supporters as well as learners, during continuous monitoring as well as piloting.

Program evaluation is a process used to determine whether the design and delivery of a program were effective and whether the proposed outcomes were met (Caffarella, 1994). Evaluation is a continuous process that begins in the planning phase and concludes with follow-up studies.

## Plans of Evaluation

Evaluation done to improve or change a program while it is in progress is termed "formative evaluation." When evaluation focuses on the results or outcomes of a program, it is called "summative evaluation." The heart of program evaluation is judging the value or worth of an educational program (Brookfield, 1986). This is not an easy task for three major reasons. First, it may be difficult to demonstrate that program outcomes are really tied to what happened in the program. Second, developing clear criteria upon which judgments can be made may be hard to do, especially for program outcomes that are not clear or quantifiable at the onset of the program. This does not mean that criteria for program success should not be developed, but that program staff may have to think differently about the evaluation processes used and about who is involved. Third, some people who plan programs may not want to make judgments about their programs or have others make those judgments. This especially true in environments where evaluations of any kind are seen as punitive or are used primarily to advance political or personal agendas (Caffarella, 1994).

There is no one acceptable systematic process for conducting a program evaluation. A number of descriptions of the process have been developed. Although systematic program evaluations are a desirable and necessary part of the programming process, Knowles (1980) and Rothwell and Kazanas (1993) have cautioned program planners of four major pitfalls. First, the outcomes of some educational programs may be too complicated, the number of variables affecting those outcomes too numerous, to allow planners to demonstrate that a given program actually produced the desired changes. Second, current evaluation procedures, however scientifically rigorous, may not be able to provide hard evidence that the more subtle, and at times more important, aspects of the educational program have been achieved. Third, conducting



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systematic evaluations costs time and money, neither of which some organizations and groups are willing to provide if they see no immediate payoff or value for evaluating programs. Fourth, when staff know that no action will be taken on the basis of evaluation findings, it may be better not to collect the data at all because the evaluation process raises expectations on the part of participants and/or sponsors that changes will be forthcoming.

There are numerous approaches to or models of educational program evaluation. These consist of a framework of perspectives and procedural methods for conducting evaluation. Because evaluation is often a multifaceted endeavor, more that one approach or model may be employed in combination in the evaluation process. The "levels of evaluation" approach (Kirkpatrick, 1987) is still the most generally used form of evaluation (Munson, 1992). The Kirkpatrick model measures four different levels or areas: (1)participant reactions, (2)learning, (3)behavior change, and (4)results or outcomes. The focus is primarily on participant reactions and changes and on organizational changes (Kirkpatrick, 1987). Participants are usually asked to complete some form of questionnaire indicating their opinion on such items as content, instructions, instructional techniques, facilities, and food service. They are also sometimes asked to more generally list the strengths and weaknesses of the program, what they perceive they have learned, and recommendations for future activities. Soliciting participant reactions is most often done at the end of the program. In addition, some program planners like to request participant feedback for individual sessions within longer programs. When evaluation data are generated for individual sessions, these data are used in two ways. The first is to provide feedback to individual instructors and presenters. The second is to contribute to a larger data set on evaluating the program as a whole (Caffarella, 1994).

In planning for evaluation of programs and curricula, it is essential that the evaluators ask themselves several guiding questions, as suggested by DiStefano (1996) in "IUPP Evaluation: What We Were Trying to Learn and How Were We Trying to Learn It." First, what were we trying to learn? What the evaluation seeks to find out must be clarified. Next, how were we trying to learn it? The range of possible ways of gathering data includes information provided by the instructor, student journal-keeping, questionnaires, site visits, and assessments of learning. Once the evaluation procedure is designed, it must be implemented by collecting student journals, tallying and analyzing questionnaires, analyzing data collected on site visits, and analysis of pre- and post-tests. Analysis of the overall data collected includes the selection of sample anecdotes from student journals, notation of the emergence of consistent signals, systematic statistical analysis of data collected (if applicable) and the drawing of conclusions, that is, asking "what did we learn?"

Jasparro (1998) promotes the systems approach to evaluation as producing better alignment among written, taught, and tested curriculum. Through the systems approach, data and information gathered through comprehensive curriculum evaluation can be used to improve other core areas of the system: organization, instruction, assessment, and professional development. A systems approach ensures uniformity in evaluating curricula in each subject area.

## Summary

Increasingly higher standards for teaching certification require increasingly higher performance on certification examinations. Standardized content knowledge examinations are a permanent feature of the teacher certification process in Connecticut; candidates must pass in order to receive their Initial Educator Certificate. There is considerable evidence to support the importance of learning test-taking skills as well as participation in test preparation courses in

leading to improved performance on a variety of test formats. The aim of test-taking skills training is to improve the overall validity of tests by making scores more accurately reflect what students really know, and to make sure that students lose points only because they do not know the information.

Assessment of student learning, as well as program effectiveness, is fundamental to program improvement. The literature describes a wide range of evaluative techniques and models, which can be used to determine the value or worth of a program. The objectives and process of evaluation must be carefully developed to avoid obstacles and complexities that will prevent the acquisition of meaningful information and therefore program improvement.

# Chapter 3

# METHODOLOGY AND PROCEDURES

## Methodology

The researcher used research methodology. The ex post facto design was used, as the examination scores of students who have completed the teacher preparation program and the certification examination were used. Inferential statistical analysis and descriptive analysis was conducted.

## Data Collection

Data was collected on the students who have completed the Physical Education teacher preparation program at S.C.S.U. between September 1, 1997 and September 1, 1999. These data consisted of the academic transcripts accessed through the university Records Office and certification examination score reports that are kept on file in the Exercise Science Department.

## Description of Population

The population of this research study included all past, present, and future undergraduate and graduate students at Southern Connecticut State University. The Physical Education teacher preparation program, like all teacher certification programs in all content areas in Connecticut, requires that certain criteria be met for School of Education acceptance. The population consists of students who have met these criteria.

## Sample

The sample consisted of all students who have completed the Physical Education teacher preparation program between September 1, 1997 and September 1, 1999. Between these dates approximately 80 undergraduate and graduate students have completed a minimum of 30 credits of the core teacher preparation program in physical education at SCSU. Data was collected on

the students who have completed the core program and have taken the Praxis II Content Examinations in Physical Education. The sample was divided into two groups - the students who have participated in the study program and those who have not.

## Instrument

The Praxis II Content Examination for Physical Education was the instrument used in this study (See Appendix A for description pages of the examinations).

## Scoring and Data Presentation

The sample was divided into two groups -- those who have participated in the study program and those who have not. The data collected for the study is presented in Table 1. The data includes the number of students who have taken the certification examination, with an indicator of "pass" or "no pass" on the first try. This data is included in the chi-square analysis.

## Data Analysis

A chi-square analysis of data was used to determine if there is a statistically significant difference in the rates of passing the Praxis II Examination by students who have taken the study course versus those who have not. The data is presented on a 2X2 chi-square table (see Table 1).

## Null Hypothesis

There is no statistically significant difference in the rates of passing the Praxis II Examination by study program participants versus non-participants.

## Alternative Hypothesis

There is a statistically significant difference in the rates of passing the Praxis II Examination by study program participants versus non-participants.

## Level of Significance

The level of significance for this study is .05, which is the level frequently used in social science studies. This level strikes a reasonable balance between Type I and Type II errors.

## Region of Rejection

The region of rejection for this study is .05, which is the conventional level for studies conducted in the social sciences. This represents the values of chi-square that are greater than the critical value of chi-square. Since the researcher was interested in determining whether the study program will lead to increased performance on the certification examination, only large increases in performance would lead to the rejection of the Null Hypothesis, therefore a one-tailed test was used (Siegel & Castellan, p. 14).

## Statistical Test

The sample size was sufficiently large to suitably apply a chi-square analysis. Therefore, a chi-square analysis, at the .05 level of significance, was used for this study. The chi-square test assesses the degree of correspondence between the observed and expected results in each group, study program participants and non-participants.

## Assumptions

A basic assumption of this study was that completion of the Teacher Preparation Program in Physical Education at SCSU is valid preparation for taking the Praxis II Content Examination in Physical Education. It was also assumed that the Praxis II Content Examination in Physical Education is a valid criterion for assessing content knowledge in Physical Education and for determining adequate content knowledge for teacher certification. It was further assumed that the study program for test preparation is valid in its content as a test preparation program.

## Limitations

The study was limited in that it was specific to the university and the teacher preparation program in Physical Education. The study is also limited in that the test preparation program was developed specifically for the Praxis II Examinations in Physical Education. Therefore, the results of the study cannot be generalized to other institutions, teacher preparation programs, or certification examinations.

# Chapter 4

## RESULTS

### Data Collection

Between September 1, 1997 and September 1, 1999, 80 students meeting the study criteria took the certification examinations. Forty-four of these students participated in the study program prior to taking the examinations, and 36 students did not participate in the study program. Of the 44 students who participated in the study program, 39 passed both examinations on the first try. Of the 36 students who did not participate in the study program, 19 passed both examinations on the first try. Study program participants passed the examinations at a rate of 88%, and non-participants passed at a rate of 54%. The data are illustrated in the diagram in Table 1.

### Data Analysis

A chi-square formula was used to calculate whether there is a statistically significant relationship between the number of students participating in the study program and the number of students passing the examinations on the first try within the time frame prescribed by the parameters of the study (McMillan & Schumacher, p. 633). It was expected that students who participated in the study program would pass the examinations on the first try at a higher rate than those who did not participate in the study program. The actual results of the data analysis are consistent with this expectation, as the diagram in Table 1 illustrates.

The use of the 2X2 table allows for one degree of freedom in calculating the critical value of chi-square at the .05 level of significance established for the study (McMillan & Schumacher, 1997). The critical value of chi-square is 3.84 (p=.05) (McMillan & Schumacher, P. 640). The calculated value of chi-square is 13.058. The calculated value of chi-square is greater than the

critical value, therefore the alternative hypothesis is supported and the null hypothesis is rejected (Isaac & Michael, p. 184).

Table 1

Chi Square Analysis of Praxis II Pass-Rate of Study Program Participants versus Non-Participants

| | | Praxis II Examinations | | |
|---|---|---|---|---|
| | | Pass | No Pass | Total |
| Study Program | Participants | 39 (88%) | 5 (12%) | 44 (100%) |
| | Non-Participants | 19 (54%) | 17 (46%) | 36 (100%) |
| | Total | 58 (74%) | 22 (26%) | 80 (100%) |

Note:

Critical value of chi square = 3.84 (1 degree of freedom and .05 level of significance)

Calculated value of chi-square = 13.058 (p= .05)

# Chapter 5

# DISCUSSION, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

## Discussion

The idea for the test preparation study program evolved from the concept of forming student-initiated study groups for various courses and students pursuing independent study. It seemed that a high proportion of students were unsuccessful in passing the Praxis II Examinations in time to receive their Initial Educator Certification in time to be job-ready at the start of the semester following the completion of their degree requirements. In fact, some students were unsuccessful in passing the examinations on several successive attempts despite participating in test preparation study groups.

In an attempt to assist students in passing the Praxis II, a faculty member collected information from students, ETS, recent graduates, and faculty members in order to gain an understanding of the Praxis II Examinations and the problem of students not passing the exams. The faculty member offered to meet with students, on a voluntary basis, to share with them what was known about the Praxis II exams. Former students who had been successful on the exams were asked to share their preparation strategies and test-taking experiences with the groups.

The faculty member devised a study prescription and, in order to field test that prescription, followed it in studying for the exams, registered for and took the examinations under the same conditions as the students. It was determined by the faculty member that the prescription was in some ways effective and in some ways ineffective, and adjustments were made accordingly. The most valuable part of the field test was, however, the test-taking experience. The faculty member recognized specific conditions in the test-taking environment, and specific skills for managing the test formats that would benefit test-takers of prepared for in advance. The authentic test-


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taking experience, in its entirety - from figuring out how to decipher the test information bulletin right through to waiting for scores in the mail and interpreting the score reporting form - directly influenced the development of the study program content and instructional strategies.

In theory, the test preparation program for the Praxis II Examinations is the planned program of studies in physical education teacher preparation. The rate of success of the examinations might be viewed as a measure of evaluation of the planned program at SCSU. However, the present planned program does not require courses in all of the areas of study that are included on the test. For example, students are required to take only one of the following: exercise physiology, motor learning, or sport psychology. The examination contains a significant number of questions on each of these areas of study. Students are encouraged to take all of the elective courses for which it is known that content knowledge will be tested on the certification exams, but students do not always elect to take all of the courses. Therefore, an argument can be made for providing a more content-specific study program for test preparation. The fact remains that students are made aware, throughout their program of studies, that the Praxis II Examinations include a high proportion of questions on the areas of study of the optional courses. Supplemental study sessions are arranged in response to student need to review specific content, and therefore specific content in specialized areas of study is not included in the study program curriculum. It is not desirable, however, to create the impression that a review session is a substitute for an entire semester course.

The field-testing of the study prescription by the program developer under authentic testing conditions was expected to prove useful. Its usefulness was anticipated in the respect that the study strategies would be tested against the content of the examinations. While the field-test was indeed useful in this regard, the greatest value of the program developer's experience was

recognized when it was revealed that a faculty member actually experienced the complete process that the students are required to undergo. As a result of the authentic experience, the faculty member could not only inform and guide students through the process of registering and studying for the examinations, and waiting for and interpreting results. The study program developer could identify with the stresses and anxieties of the students, and could understand the effects of testing conditions the students would encounter. This set of experiences helped the program developer to identify realistic skills that were important for success in the test-taking process.

Methodological issues are encountered when attempting to evaluate a college course's effectiveness by determining whether students who enroll in it perform at higher levels than students who did not enroll. The research purpose must be clearly defined in order to determine the parameters and methods that will be used in the study. Of the four basic research models, the two that were considered for use in determining the effectiveness of the study program were the post-facto design and the time series design. The post-facto design was considered for a comparison of the pass-rate of the treatment group (students participating in the study program) with the pass-rate of the group consisting of everyone else who did not participate in the program during the same time period. The time series design was considered for a comparison of the pass-rate of the treatment group with the pass-rate of the group consisting of all students who have taken the examination during two periods of time - before the study program was available and after the program became available. Several variables may have affected the pass-rate of students during the four years in which the Praxis II Examinations have been required, such as differences in the student population, changes in faculty, changes in course content and presentation, and overall differences in the teacher preparation program. Therefore, the ex post

facto design was selected for use in analyzing the statistical data. That is, the pass-rate of the treatment group (students participating in the study program) was compared with the pass-rate of the group consisting of everyone else who did not participate in the program during the same time period. During the time period from September 1997 to September 1999, 39 out of the 44 students who participated in the study program passed both Praxis II exams on their first try following completion of the program. The pass-rate of that group was 88%. Of the 36 students who did not participate in the study program, 19 passed. This group's pass-rate was 54%. The participant group's rate of 88% exceeds the 74% pass-rate of the combined group of all test takers during that time period.

## Conclusions

The analysis of the data clearly shows a pattern in which those students who participated in the study program achieved passing scores on the certification examinations at a significantly higher rate than those students who did not participate in the study program. The answer to the research question, "Is the study program effective in improving the pass-rate on the certification examination?" is , therefore, answered in the affirmative.

## Implications

Educational Testing Service researchers conducted a study of teachers' skills and the impact of raising standards for teachers (Gitomer & Latham, 1999). In the study, ETS examined the potential impact of raising required passing scores on the Praxis tests. Raising those scores would, indeed, significantly raise the average admissions score of those who pass with higher standards, the researchers concluded. However, far fewer candidates would pass those assessments, and the impact would be greater for minority groups. "States face some difficult choices as they grapple with the issue of teacher shortages," the researchers say, "and with a

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teacher population that does not come close to reflecting the diversity of the students in the educational system" (Gitomer & Latham, p. 2). In light of the prospect of higher test score requirements, it will be especially critical to assist students in demonstrating the extent of their content knowledge.

It is anticipated that the results of the study will be used to improve the services provided to the students in the physical education teacher education program. As the effectiveness of the study program in raising the pass-rate on Praxis II becomes known, it will likely become a regular offering to students, therefore ensuring that students have the opportunity to learn to use it. The study program is not expected to be offered for credit to either faculty or students, and it is doubtful that a fee will be charged. That a service will be available to students, on a regular basis, will be good for public relations within the student population, and this development can potentially motivate other teacher preparation programs within the School of Education to develop and provide similar services.

Another anticipated benefit is that an increased proportion of graduates of the teacher preparation program will be qualified to enter the teaching profession earlier following the completion of their preparation programs. The results of this study may be included in the review of the School of Education and the teacher preparation program. In this time of increasing teacher shortages in Connecticut, a program that increases the number of job-ready teacher candidates would significantly benefit the reputation of the university as a source of job-ready teachers, and will therefore increase the probability of placing graduates in new teaching positions throughout the state.

Educational practice at SCSU should be improved because it is expected that the test preparation program will become a regular component in the teacher preparation continuum.

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However, the Connecticut State Department of Education Bureau of Teacher Certification and the Department of Higher Education continually monitor the certification requirements for teachers as well as national trends and practices in teacher preparation. There is no guarantee that the current teacher certification requirements will not change in the near future. The physical education teacher preparation program at SCSU is preparing for its NCATE accreditation self-study during the 1999-2000 academic year, and is currently reviewing its planned program of studies. The implications of this trend include the need for planning and implementation of ongoing evaluation of all aspects of the planned program of studies including the test preparation program.

## Recommendations

Standard practice within the Exercise Science Department has been a lack of involvement in assisting students in preparing for the culminating requirement of the teacher certification program, that is, the certification examination. This study suggests that the test preparation study program is a significantly helpful factor in students' success on the certification examinations. The implications that can be drawn from the relationship between students' participation in the test preparation study program and their success in passing the certification examinations include the consideration that the Exercise Science Department may benefit from ensuring that the study program continue to be provided for students.

Since only about half of students are participating in the study program, it may be inferred that the existence of the program, and the effectiveness of the program, is not well-known among the advisors. It is therefore recommended that the faculty be more informed about the program and its significant impact on the examination pass-rate. As a part of this strategy, it is recommended that the department employ the practice of strongly encouraging students in their


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last year to participate in the study program. Perhaps advisors can be reminded to make this recommendation by inserting a study program flyer in the advisement folders of students who are about to register for their fourth year courses.

It is further recommended that the study program be listed in the planned program during the student's senior year in order to make students, as well as faculty, more aware of the availability of the program and the advisability of taking it. The placement of the study program on the planned program documents would necessitate that the program be provided to students on a regular and ongoing basis. The faculty member who has developed the study program provides it for students on a voluntary basis, in addition to a full teaching load. In order to ensure that the program is provided on a regular basis, it is recommended that the program coordinator explore the possibility of including the facilitation of the study program in the faculty member's teaching credit load.

The results of this research study may be included in the review by the School of Education and the teacher preparation program. The effectiveness of the study program should be made as widely known as possible to students and to the educational community. The success of this program can be used as a vehicle for improving the reputation of the university and the physical education teacher preparation program as sources of job-ready teachers in a time of teacher shortages in Connecticut.

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# APPENDIXES

Appendix A

# Physical Education: Content Knowledge (0091)

## Test at a Glance

| | |
|---|---|
| Test Name | Physical Education: Content Knowledge |
| Test Code | 0091 |
| Time | 2 hours |
| Number of Questions | 120 |
| Format | Multiple-choice questions |

| | Content Categories | Approximate Number of Questions | Approximate Percentage of Examination |
|---|---|---|---|
| I. | Fundamental Movements, Motor Development, and Motor Learning | 29 | 24% |
| II. | Movement Forms | 29 | 24% |
| III. | Fitness and Exercise Science | 23 | 19% |
| IV. | Social Science Foundations | 13 | 11% |
| V. | Biomechanics | 10 | 8% |
| VI. | Health and Safety | 16 | 14% |

## About this test

The Content Knowledge test in Physical Education is designed to measure the professional knowledge of prospective teachers of physical education in elementary through senior high schools. The test assesses whether an examinee has the knowledge and competencies necessary for a beginning teacher of physical education.

The 120 multiple-choice questions cover knowledge of fitness, fundamental movements, and sports that comprise the content of physical education classes; knowledge of areas in the natural and social sciences that provide the foundation for teaching these activities; and knowledge of crucial topics in health and safety. Knowledge of these subject areas enables teachers to understand the nature and purpose of the activities in the physical education curriculum; to evaluate and interpret the physical characteristics and performances of students in physical education classes; and to make decisions about the ongoing conduct of physical education classes and the needs of students in those classes. Questions will test knowledge of essential facts, including the meaning of terms and placement of content elements in proper categories; understanding of relationships between and among areas of content; and the ability to apply concepts appropriately.



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Appendix B

# Physical Education: Movement Forms — Analysis and Design (0092)

THE PRAXIS SERIES

## Test at a Glance

| | |
|---|---|
| Test Name | Physical Education: Movement Forms — Analysis and Design |
| Test Code | 0092 |
| Time | 1 hour |
| Number of Questions | 2 multipart essay questions |
| Format | Each essay question requires the examinee to describe characteristics of movement forms, to design or prescribe appropriate movement routines to achieve specific goals, and to provide explanatory information |

## About this test

The Movement Forms – Analysis and Design test in Physical Education is intended to assess how well a prospective teacher of physical education can select activities for particular purposes, make decisions about the status and needs of students, and provide explanation for these selections and decisions. The test covers knowledge of fitness, fundamental movements, and sports that comprise the content of physical education classes; knowledge of the foundations for teaching these activities; and knowledge of crucial topics in health and safety. The test is intended for both men and women who plan to teach physical education from kindergarten through grade 12. Examinees typically have completed a bachelor's degree program in physical education.

The test contains two questions. They deal with health-related fitness, the ability to analyze movement forms in terms of the progression from introductory to advanced levels of skill performance, and the selection and description of movement activities that will enable children to reach specified goals in physical education. Examinees are expected to demonstrate knowledge of the critical features of movement forms and how these features shape the design of activities intended to help children master these features. Examinees will not be expected to demonstrate knowledge of teaching methods in physical education or of general principles and methods of planning and implementing instruction. Across the test questions, examinees will describe characteristics of movement forms; design and/or prescribe appropriate movement routines to achieve specific goals; and provide explanatory and justifying information on content topics from the foundations of physical education, as well as health and safety issues. Question content also includes concepts relating to motor skill performance and fitness, including fundamental movements, movement forms, and fitness as described in the Physical Education: Content Knowledge Test 0091.

Several documents published by the National Association for Sport and Physical Education (including *Outcomes of Quality Physical Education Programs*) have been used in preparing the test questions. This publication and other related publications may be obtained from AAHPERD Publications by calling the following number: 800-321-0789.



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# Appendix C

## TEST PREPARATION STUDY PROGRAM

## OUTLINE

The Praxis II Test Preparation Study Program is a seminar and workshop format, which meets five times with groups of students who are planning to take the Praxis II Examinations in Physical Education Content Knowledge (0091) and Physical Education: Movement Forms - Analysis and Design (0092) in the foreseeable future. Students attend voluntarily. Sessions are one hour in length, except for Session 3, which is a 2-hour simulated test. There is no fee for participation in the study program, and no academic credit is awarded. The instructor, who has taken the Praxis II Examinations and developed the program, provides the study program voluntarily. No teaching credit is awarded.

**SESSION 1**

Description of the Praxis II Examination
- Purpose
- Requirements
- Background information and brief history
- Examination format

Distribution of ETS materials
- Information booklets (ETS)
- Tests-at-a-Glance Booklets pertaining to the physical education examinations

Introduction of sample questions, provided in the ETS test information materials

Introduction of suggested study materials
- For Content Knowledge Examination (0091):
  - Foundations of Physical Education and Sport (Bucher & Wuest) textbook used in EXS 191 freshman year introductory course
  - Other similar texts
- For Physical Education: Movement Forms - Analysis and Design (0092):
  - AAHPERD Physical Best Individual Physical Fitness Programming Guide

Distribution of sample examinations
- Multiple choice content knowledge examinations (answers provided at back of exam)
- Constructed response questions

Assignment for next session:
- Take one or more of the multiple choice content knowledge examinations, with no time limit, and check answers
- Categorize questions answered incorrectly as follows:
  1. fundamental movements, motor development, motor learning
  2. movement forms
  3. fitness and exercise science
  4. social science foundations
  5. biomechanics
  6. health and safety
- Identify weak areas (above) and focus review on these areas

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SESSION 2

Panel of previous test-takers to describe their test-taking experiences
- Registration process
- Preparation and study process
  - Materials and sources that were particularly helpful
- Test Day experiences, prior and on-site, what to expect at the testing center
- Problems, distractions, frustrations
- Strategies and other suggestions

Review of assignment from previous session
- Identification of strengths and weaknesses

Test-taking strategies
- Op-Scan answer sheets, AKA: bubble sheets
  - Strategies for using
  - Distribute several to each participant for practicing
- Time management strategies
- Preparation the night before, and morning of
- Getting and staying "in the zone" - strategies for tuning out distractions

Assignment for next session
- Continue review of weak areas
- Meet for practice test - 2-hour session
  - Take NTE practice multiple choice exam (distribute) under test-taking conditions (time limit, using bubble sheet)

**SESSION 3 - 2 hours**

Practice test, using NTE multiple choice examination
Simulate actual testing conditions - 120 questions, time limit 120 minutes, bubble answer sheets
Allow test-takers to take exam, answer sheets and answers home

**SESSION 4**

Share experiences from simulated testing session
Discuss Physical Education: Movement Forms - Analysis and Design (0092) AKA: essay exam
Review sample questions
- Refer to AAHPERD Physical Best guide
  - Identify key points to include in constructed response to Question 1
  - Discuss possible variations in presentation of question
- Refer to course journals for EXS 394, EXS 483, and EXS 495 instructional methods courses for sequencing of instruction
  - Identify key points to include in constructed response to Question 2
  - Discuss possible variations in presentation of question

Assignment for next session
- Construct responses to sample essay questions
  - No time limit
  - Construct responses to variations of questions discussed
  - Use outline and charting/matrix formats with brief introductions
- Bring responses to next session to share with the group

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SESSION 5

Share constructed responses
Peer and instructor assessment according to previously established criteria
Share study and test-taking strategies
Suggestions from group and instructor
Encourage group members to participate in the panel discussion (Session 2) after they have taken the examinations to share their experiences with others
Encourage participants to provide feedback to instructor regarding the study program

Resources used in the preparation of the study program:


Loulou, D. (1995). Making the A: How to Study for Tests. ERIC Digest. ERIC Clearinghouse on Assessment and Evaluation.

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